Model of a Landfill

One of my students' model of a landfill, complete with groundwater (blue paper), dirt, and wildlife (plastic animals).
Lesson #5

What Are Ways To Use Resources Again?

No Time To Lose

Reduce, Recycle, Reuse

AUB RECYCLING PROJECT
www.aub.edu.lb/~weburp
Lesson #5
What Are Ways To Use Resources Again?

Materials:
- Scott Foresman Science textbook, Grade 3, pages 254-257, one per student [attached]
- Please Recycle! Handout, one per student [attached]
- large brown paper bag, one per student

Objective/Academic Standard:

Science Standard 1 ~ The Nature of Science and Technology → Students, working collaboratively, carry out investigations. They question, observe, and make accurate measurements. Students increase their use of tools, record data in journals, and communicate results through chart, graph, written, and verbal form.

Technology and Science 3.1.8 → Describe how discarded products contribute to the problem of waste disposal and that recycling can help solve this problem.

The student will be able to participate in a classroom discussion about recycling and examples of what we can and cannot recycle. The student will also be able to define recycling, as well as giving examples of every day items that may be made from recycled materials. The student will also be able to construct an art project made of garbage from home.

Motivation:

I will begin today’s lesson by going over what we have been learning about the environment in the past few days (resources, renewable and nonrenewable, conservation, landfills, etc). I will tell the students that today we are really going to focus on recycling. I will pass out a “Please Recycle!” paper to each child, as well as a large paper bag. I will explain to the students that we will be hosting our own paper recycling drive, and the students can collect paper from home and bring it into school on Fridays to be recycled. We will weigh it every week and keep track of how much paper we have recycled on a bulletin board.
Goal for Learner:

The goal for the learner for this lesson is that the student will be able to participate in a discussion about recycling, as well as be able to give examples of what can be easily recycled. The student will also be able to show his/her creative side by making an art project from (clean) garbage from home, which is also showing that he/she can recycle things as well.

Content and Procedures:

Teacher Content: Recycling is when you change something so that it can be used again. Glass is recycled by first sorting it by color, then it getting broken into pieces called shards. The shards are shipped to a glass company, which removes metal caps and rings from it. Then it is crushed into tiny particles called cullet, which means it is ready to be made into new glass things, such as bottles, jars, or windowpanes. Recycled materials can be used over and over again. Playgrounds can have a surface made out of recycled tires. Sleeping bags might have stuffing that includes shredding from plastic bottles. The three R’s are reduce, reuse, and recycle.

Procedure:

- I will have the students open their science books to page 254, which is the beginning of Lesson Three of Chapter Nine. I will have the students read the title of this lesson, and then ask them what they think we’ll be learning about for this lesson (ways to use resources again).
- I will have the students read pages 254-257 silently, while I read aloud. This is in the interest in time, and also to cater to the needs of visual and auditory learners. We will periodically stop during the reading for spontaneous discussions on what we have read, such as how glass is recycled, how some things can be recycled over and over again, the different items that can be made from recycled materials, the three R’s, etc.
Accommodations for all special education students:

- Give directions one at a time.
- Check for understanding.
- Repetition of directions.
- Restate directions for clarification.
- Extended time for assignments.

Practice/Application:

I will tell the students that they will create their own art project by using recycled materials. I will not give a lot of guidelines to this project, as I want each student to be able to express their unique creativity. This is something that all students can do, seeing that everyone has garbage at home. The only restrictions that I will place on the art project is that it must be small enough for them to carry, and it cannot include food. This project will help the students see that new things can be made from old trash.

Evaluation of Student Learning:

I will give credit for one homework assignment to those students who complete the project, as I don’t feel it is fair for me to judge their creativity. The students just have to create their art project, bring it in to class, and explain to the class what they created and what kinds of recycled materials they used.

Closure:

I will ask the students, “Who can tell me what the Three R’s are? (reduce, reuse, and recycle) What is something that old tires can be made in to? What about plastic shreedings?” I will ask the students if they have any questions, or if they have any more examples of items that can be made from recycled materials.
Evaluation of Lesson: Personal Reflection

The art project was an incredible success! I had my doubts about whether my students would complete it successfully, as this was the first time in their lives that they had been asked to complete a project at home. I was overwhelmed with the large amount of creativity that was displayed through these art projects. The students seemed very interested today in what new things could be made of recycled materials, and many of them mentioned that they have played on a playground before that uses recycled rubber tire bits as the surface. Once again, I tried to keep the lesson as lively as possible while reading out of the book, and I believe I maintained the students’ attention. They also got extremely excited about their paper recycling project, and seemed to like the idea of being able to help recycle paper at home. I stressed that nobody had to do the recycling, and that it was completely their choice. I taught this lesson on a Wednesday and thought that nobody would remember to bring in paper from home two days later... but I was wrong! The students brought in a large amount of paper to be recycled. We are going to start weighing it every week and track our progress. I am going to try to think of some kind of reward for them if we meet our goal, which is yet to be determined. I am really happy that I have gotten my students so excited and aware of recycling, and I really hope that they carry it with them after my student teaching experience is complete.
Lesson 3

What are ways to use resources again?

**Science Objective**

The student knows that reusing, recycling, and reducing the use of natural resources improve and protect the quality of life.

1 | Introduce

**Quick Activity**

- Display an empty plastic milk jug, a used toy or article of clothing that third graders would have outgrown, and a coffee can.
- Ask students how each item might be used again.
- List the items across the board, and write students' ideas for uses under each one.

**Access Prior Knowledge**

Bring in one or two common household items that have the recycling symbol on them. Ask students to tell you what this symbol means.

**Set Purpose**

Tell students that they are going to read about more ways to reduce trash. Help them to set a **purpose for reading**, such as looking for ways that materials can be used again.

2 | Teach

**Quick Summary**

- Reusing and recycling things conserve resources.
- To recycle means to take something that contains useful resources and change it into something that can be used again.
- Metal, glass, plastic, and paper products are things that can be recycled.

Have students read pages 254-255. Access Quick Study pp. 64-65 to students who...

---

**Lesson 3**

What are ways to use resources again?

Many things can be used more than once. Old materials can be used to make new things. Reusing and recycling conserves land, keeping it from becoming landfill space.

**Using Resources Again**

When you reuse things, you conserve resources. For example, you can reuse cloth napkins, but not paper ones. You can reuse empty jars to store leftover food. Or you can give toys and clothes you have outgrown to others to use.

Another way to conserve resources is to recycle things that contain useful material. You **recycle** when you change something so that it can be used again. The useful resources that went into making objects can then be made into new products. Many of these new products are made from recycled metal, glass, plastic, or paper.

1. **Sort Glass**
   
   Recycled glass bottles and jars are separated by color. They are broken into small pieces.

2. **Ship to Glass Company**
   
   Pieces of glass are put into boxes. The boxes are shipped to a glass reprocessing company.

---

**Lesson 3 Resource**

Workbook, p. 86
Let’s follow the process used to recycle things that contain glass. Workers at the recycling plant sort glass by color. Common colors are clear, brown, and green. The bottles and jars are then broken into pieces called shards. Shards are shipped to glass companies. Glass shards must be passed under a magnet to remove metal caps and rings. Shards are then crushed into grain-sized particles called cullet. The cullet is cleaned and dried. Now the cullet is ready to be turned into new glass things. It is melted in furnaces and blown by machines into glass bottles and jars. Some is flattened into windowpanes. If glass is recycled, it can be used over and over again.

1. **Checkpoint** What are the four main types of materials that are recycled?
2. **Compare and Contrast** How is recycling glass the same as recycling water? How does recycling glass differ from recycling water?

---

**Guide Comprehension**

Ask students the following scaffolded questions to assess understanding.

**Scaffolded Questions**

1. **Identify** What are two main ways to conserve resources? Reuse and recycle products.
2. **Sequence** What are the steps to make a new glass product from used glass? Sort, ship broken pieces to a reprocessing plant, remove any metal, crush into grain-sized particles, clean and dry, melt and reform.
3. **Differentiate** How is reusing a soup can as a pencil cup different from recycling a soup can? Reusing the soup can means using the can for another purpose. Recycling a soup can means changing it from a soup can into another product.

---

**Extend Vocabulary**

Tell students that the word *recycle* is made up of the prefix *re-* meaning “back” or “again,” and the word *cycle*, which comes from the Greek word *kyklos*, meaning circle. Ask students what things they can think of that move in cycles (the days, the year, the water cycle).

---

**Diagnostic Check**

If... students do not understand the difference between reusing and recycling,

then... refer students to the ideas they had for the plastic milk jug in the Quick Activity, explaining that these are ways to reuse the jug itself. Then show them a piece of synthetic carpet, playground equipment, or some other item made from recycled plastic. A recycled product may have a totally different appearance from the original product.

1. **Checkpoint** Metal, glass, plastic, paper
2. **Compare and Contrast** Both recycling glass and recycling water conserve natural resources. Both require processing before the materials can be reused. Processing used material such as glass, unlike processing used water, takes a lot of energy. The recycled glass is made into totally new things.

---

**ELL Leveled Support**

**The Language of Recycling**

**Beginning** Have students work in pairs to select words on pages 254–255 that are unfamiliar (e.g., leftover, outgrown, shards). Have students use the context and word structure to write a definition of each word, and then discuss their definitions with you.

**Intermediate** Have students retell the process of glass recycling by restating the captions for the four steps in the process.

**Advanced** Have students choose a product or resource and work with a non-ELL student to investigate how it is recycled. They might choose paper, aluminum cans, batteries, or plastic bags. Their findings can be reported in illustrations with captions and presented orally.

For scaffolded instruction about recycling, use *Every Student Learns Teacher’s Guide*, p. 41.
Science Objective

The student knows that reusing, recycling, and reducing the use of natural resources improve and protect the quality of life.

Teach (continued)

Quick Summary

Recycling is encouraged.
Conserving requires buying or using products that are made from recycled materials.
Natural resources can be protected by the three Rs: reducing, reusing, and recycling.

Ask students to read pages 256–257.

Ask students' attention to the photographs on the page. Have them identify which items have been reused and which are products made of recycled materials (Reused: wall made of tires and plastic; Recycled: park bench and playhouse).

Using Recycled Materials

Reusing and recycling are not new ideas. Your great-grandparents might have bought flour in cloth sacks. They cleaned the empty sacks, cut them, and sewed them into rags, towels, and even clothing!

Today, recycling is easier than ever. Many communities collect items to be recycled when they collect the regular garbage. Places such as movie theaters and office buildings have special containers for bottles and cans. Grocery stores collect used plastic shopping bags that can be recycled.

Conserving recycled material requires buying or using products that include it. For example, you can shop for products made out of recycled material. Your next sleeping bag might include stuffing made out of shredded plastic bottles. Your next sweater might be knit out of yarn recycled from old garments. Or you can play on playgrounds that have a surface made out of shredded car tires.

Science Misconception

Students might mistakenly think that all materials can be recycled. These items cannot: both regular incandescent and fluorescent light bulbs; ovenproof dishes; drinking glasses; crystal; paper that has a wax, plastic, or foil coating; and used cardboard pizza boxes.

Math Link

Analyzing Data

Recycling aluminum cans is a way to reduce trash, but fewer cans are being recycled. Most cans are being thrown on the ground or into landfills. In 1992 people recycled about 65 cans out of every 100. In 2001 people recycled about 49 cans out of every 100. Ask students: Out of every 100 cans recycled, how many more cans were recycled in 1992 than in 2001? 16
The Three R's

What's a good way to remember what you've learned to protect natural resources? Just think about the three R's—reduce, reuse, and recycle. Reduce the amount of resources you use and the trash you make. Reuse old things in new ways. Recycle everything you can. Every time you practice one of the three R's, you are helping to care for Earth.

Stuffing in this sleeping bag and yarn in this sweater are from recycled materials.

Lesson Checkpoint

1. Why is it important to recycle?
2. What are the three R's?
3. Art in Science Draw or make a model showing how you might reuse something in an unusual way.

Guide Comprehension

Ask students the following scaffolded questions to assess understanding.

Scaffolded Questions

1. Cite Examples How has recycling been made easy? Communities collect items to be recycled; containers are available to collect bottles or cans.
2. Differentiate Why is the playhouse in the photograph on page 257 an example of recycling rather than reuse? The plastic milk jugs used to make the playhouse have been made into something entirely different.
3. Devise What plan could we make up to reduce paper use in our classroom? Possible answers: Have a recycle box for used paper; write on the back of paper.

Extend Vocabulary

The three R's—reduce, reuse, recycle—all involve the prefix re-, meaning "back" or "again." Discuss how the meaning "again" is important to conserving resources.

Assess

1. Recycling saves resources, energy, and landfill space.
2. Reduce, reuse, recycle
3. Art in Science Drawings or models might show a new use for tires, plastic bottles, newspapers, and so on.

Link

Artists use discarded items to make sculptures and other threedimensional artwork. Have students bring in scraps and discards—from pieces of material, old cans and other containers (cleaned), board, broken crayons, buttons, and so on. Encourage students to their own artistic creations with reused materials.
PLEASE RECYCLE!
The class poses with their garbage art projects.

Nicholas shows off his Coke-can robot.
Lesson #6

Making Recycled Paper

[Image of a pile of recycled paper]
Lesson #6
Making Recycled Paper

Materials:
• several sections of newspaper, one section per student per class
• large clear plastic cups, one per student
• plastic spoon, one per student
• water, about 32 oz per class
• wax paper, one piece large enough to cover a student’s desk, one per student
• overhead of “Can Paper Be Recycled? What To Do,” one per class [attached]
• “How Can Paper Be Recycled?” worksheet, one per student [attached]
• area where all of students’ recycled paper can sit and dry overnight, one area per class

Objective/Academic Standard:

Science Standard 1 ~ The Nature of Science and Technology ➔ Students, working collaboratively, carry out investigations. They question, observe, and make accurate measurements. Students increase their use of tools, record data in journals, and communicate results through chart, graph, written, and verbal form.

Technology & Science 3.1.8 ➔ Describe how discarded products contribute to the problem of waste disposal and that recycling can help solve this problem.

Science Standard 6 ~ Common Themes ➔ Students work with an increasing variety of systems and begin to modify parts in systems and models and notice the changes that result. They question why change occurs.

Systems 3.6.1 ➔ Investigate how and describe that when parts are put together, they can do things that they could not do by themselves.

Systems 3.6.2 ➔ Investigate how and describe that something may not work if some of its parts are missing.

Models and Scale 3.6.3 ➔ Explain how a model of something is different from the real thing but can be used to learn something about the real thing.
Language Arts Standard 2 ~ Reading Comprehension ➔ Students read and understand grade-level-appropriate material. They use a variety of comprehension strategies, such as asking and responding to essential questions, making predictions, and comparing information from several sources to understand what is read. In addition to their regular school reading, at Grade 3, students read a variety of grade-level-appropriate narrative (story) and expository (informational and technical) texts, including classic and contemporary literature, poetry, children’s magazines and newspapers, reference materials, and online information.

Comprehension & Analysis of Grade-Level-Appropriate Text 3.2.7 ➔ Follow simple multiple-step instructions.

The student will be able to follow multiple-step instructions and make their own recycled paper out of newspaper. They will also be able to identify the essential steps in how to make recycled paper, and explain how their model represents the entire process of recycling paper.

Motivation:

I will begin today’s lesson by already asking the students to completely clear off their desks. This will undoubtedly confuse them, because they are used to having at least a pencil out for school activities. I will ask them what we’ve been talking about lately (recycling), and ask them what materials we have decided to recycle in our classroom (paper). I will then ask them if they have ever wondered how paper is recycled, and then tell them that today, not only will they find out, but they’ll actually recycle paper themselves and get to take it home the following day.

Goal for Learner:

The goal for the learner for this lesson is that the student will make his/her own recycled paper out of newspaper and water. The student will learn that their model of recycled paper is a small part of a large process, but that the general idea of how to recycle paper is the same. The student will be able to make his/her recycled paper by following multiple-step instructions, which will be posted on the overhead.
Content and Procedures:

Teacher Content: To make recycled paper, the student has to rip up newspaper into pea-sized bits, add a little water, and stir and mash the mixture together until it forms a thick and slightly chunky paste. Then the student will spread the mixture thinly over the wax paper, making sure to leave no spaces between mixture chunks. Let the mixture dry overnight, and the next morning, the student will have a little piece of recycled paper that he/she has made him/herself. Also explain to the students that this is not how large recycling plants recycle their paper (with cups, water, and spoons), but that they do it on a much larger scale.

Procedure:

- I will tell the students that they should look at the overhead and read it silently, while I read it aloud. We will go over instructions before any materials are handed out, just to prevent further distraction once the manipulatives are in the students' hands.

- I will pass out one piece of wax paper, one cup, one spoon, and one section of newspaper to each student. I will instruct the students to read the first direction on the overhead, which is "Tear scrap paper into tiny pieces and put them in the plastic cup." I will give the students between five and ten minutes to complete this portion of their activity.

- Once the students have a good amount of pea-sized paper bits in their cups, I will tell them to come to me (one at a time), so I can pour the appropriate amount of water in their cups. I will only add enough water to make all the paper wet, so the students can stir it around and have it start to mesh together. I will then instruct the students to read directions number two and three, which say to add the water and stir with the spoon. I will give the students about ten minutes to stir the mixture with the spoon, getting it as smooth as possible (but not too wet). If too much water is added, I will have the students put more paper bits in the cup.
• I will then tell the students to scoop their mixture out on to their wax paper, and use the spoon to smooth it out and get rid of spaces. If the spoon doesn’t work, I will allow the students to use their fingers to flatten the mixture out.

• After the students have had adequate time to complete this, I will have them lay their wax paper out in the designated area (I will also make sure they write their names on the wax paper, so they know which project is theirs the following day) and return to their seats to clean up their mess.

• We will then have a discussion about the process of recycling paper, and what it started off looking like and what it currently looks like. We will also talk about how big recycling plants don’t necessarily recycle their paper with cups and spoons, but that they do a similar project, but with hundreds of pounds of paper.

Accommodations for all special education students:

• Give directions one at a time.
• Check for understanding.
• Repetition of directions.
• Restate directions for clarification.
• Extended time for assignments.

Practice/Application:

The application for today’s lesson on making recycled paper is having the students complete the “How Can Paper Be Recycled?” worksheet for homework.

Evaluation of Student Learning:

I will grade and record the grades of the students’ work on the “How Can Paper Be Recycled?” worksheet, which will be turned in the day after the making recycled paper project. The goal is for each student to get at least 75% on the homework, or 1½ out of 2 possible correct.
Closure:

To close this lesson, I will tell the students that they will be able to observe and take home their recycled paper the following day. The next day when the students come into class, I will pass out the dried recycled paper and we will discuss what it looks like, what it feels like, etc. They will then be invited to take their recycled paper home and share it and the experience with their families.

Evaluation of Lesson: Personal Reflection

My students were surprisingly cooperative during this activity. They don’t generally get to do a lot of “fun” projects, so I knew this would be a big deal for them. I wasn’t sure if they would be able to control themselves during the activity (“control” really meaning “be quiet”), but they were very helpful and respectful during the project. The portion of the project that took a lot longer than I had originally anticipated was the ripping up of the newspaper part. Some of the students were being extremely careful, and most were making the shredded pieces too large. Pieces of newspaper bits littered the floor after the project was completed, but my students did a very good job of picking up after themselves. If I could change anything about this project for next time, I would probably get rid of the spoon part and just have the students use their hands to smooth and spread the mixture out. Using their fingers proved to be more efficient anyway, and all we had to do after that was send them to the restroom to wash their hands. The students were very proud of themselves the next day with their finished products, and I overheard several of them talking excitedly to each other about getting to show their parents what they made. Overall, I feel this lesson was an accomplishment.
Can paper be recycled?

**What to Do**

1. **Try:** **Scrap paper into tiny pieces.** Put them in the plastic cup.
2. **Try:** **Add just enough water for all the paper to get wet.**
3. **Try:** **Use the spoon to stir the tiny wet pieces of paper.**

4. **Scoop the mixture onto the wax paper.** Flatten the clump of wet paper with the back of the spoon to make one layer with no spaces.

5. **Let the mixture dry overnight.**

**Observe the paper the next day.**

**Skills**

I can learn to help the

**Think About It**

1. **Observe** What does the recycled paper look like?
2. **Evaluate** How can recycling paper help the environment?
How can paper be recycled?

Think About It

1. **Observe:** What does the recycled paper look like?

2. **Infer:** How can recycling paper help the environment?
How can paper be recycled?

Think About It

1. **Observe:** What does the recycled paper look like?
   - Green, flat, it even looks like someone threw it up.

2. **Infer:** How can recycling paper help the environment?
   - Less trees are yose and we do not have as much landfills.
How can paper be recycled?

Think About It

1. Observe: What does the recycled paper look like?
   - Yes, can recycled paper

2. Infer: How can recycling paper help the environment?
   - You might net to look for a plant that has a trash bin.
Dear Parents/Guardians -

In correlation with our Save The Environment Unit, our 3rd grade class has started a paper-recycling project, as you might already know. A paper bag with a recycling sign taped on it has already been sent home, and your child knows that he/she may put paper in it from home that would normally be thrown away. The only material that we are going to recycle is clean paper (in other words, not paper that has food on it, excessive dirt, etc). At the end of each week, your child may bring in his/her recycling bag to our classroom, and we will collect the paper, weigh it, and recycle it. As a class, we decided that our goal is to recycle **500 pounds of paper by December 9, 2005**. It is not a requirement that your child participates; we are just trying to make others aware of being able to help our environment! If you have any questions, you may contact Miss Meyer (the student teacher) by calling Grissom Elementary. Thanks in advance for helping our classroom try to reach our goal!

Sincerely -

Miss Meyer, student teacher
Truman poses with his finished recycled paper project.

The class rips up newspaper into tiny pieces.
Lesson #7

Rate A Lunch Bag
Lesson #7
Rate A Lunch Bag

Materials:
- students' packed lunches from home, ideally one lunch per student
- “Rate-A-Lunch Bag” worksheet, one per student [attached]

Objective/Academic Standard:

Science Standard 1 ~ The Nature of Science and Technology → Students, working collaboratively, carry out investigations. They question, observe, and make accurate measurements. Students increase their use of tools, record data in journals, and communicate results through chart, graph, written, and verbal form.

*Scientific Inquiry* 3.1.3 → Keep and report records of investigations and observations using tools, such as journals, charts, graphs, and computers.

*The Scientific Enterprise* 3.1.5 → Demonstrate the ability to work cooperatively while respecting the ideas of others and communicating one’s own conclusions about findings.

*Technology & Science* 3.1.8 → Describe how discarded products contribute to the problem of waste disposal and that recycling can help solve this problem.

Language Arts Standard 2 ~ Reading Comprehension → Students read and understand grade-level-appropriate material. They use a variety of comprehension strategies, such as asking and responding to essential questions, making predictions, and comparing information from several sources to understand what is read. In addition to their regular school reading, at Grade 3, students read a variety of grade-level-appropriate narrative (story) and expository (informational and technical) texts, including classic and contemporary literature, poetry, children's magazines and newspapers, reference materials, and online information.

*Comprehension & Analysis of Grade-Level-Appropriate Text* 3.2.7 →
Follow simple multiple-step instructions.

The student will be able to follow multiple-step instructions. The student will also be able to fill out a chart that contains information about the lunch he/she is looking at, as well as answer questions that correspond with that chart. The student will also be able to work cooperatively with those around him/her, and communicate his/her ideas with a classmate. The student will also be able to identify why and how discarded products contribute to the problem of waste disposal and that recycling can help solve this problem.
Motivation:

I will begin today’s lesson by asking the students who have brought their lunches from home to get them out and put them on their desks, but to *not touch them*. It is probable that not all students will bring a lunch from home, so I will then partner up the remaining students with a classmate that has a lunch sitting on his or her desk. I will tell the students that we are going to be looking at the packaging of their lunches today. I will ask them if they can describe what packaging might be, and we will come up with a solid definition of the word. I will also stress that this activity will involve no eating.

Goal for Learner:

The goal for the learner for this lesson is that the student will be able to accurately fill out a chart and read the chart’s information on rating a lunch bag. The student will also be able to talk with a classmate about what he/she observed. The student will also be able to inform how garbage from a lunch bag is a smaller part of the large problem of waste disposal, as well as give suggestions as to what can be done to help solve this too-much-waste problem.

Content and Procedures:

Teacher Content: Ask students to bring in their lunches from home the day before this activity. Go over what “packaging” (the materials that hold things) is, and talk about how we can reduce the garbage that comes from packaging (use a reusable lunch bag, drink out of the same water bottle every day, use plastic Tupperware, etc).

Procedure:

- After the class has determined a proper definition of “packaging,” I will pass out the Rate-A-Lunch Bag worksheet to each student. I will ask them to read the first direction and follow it (take out the contents of your lunch bag and put it on the desk).
• I will then ask the students to move on to step number two, which is to record the number of items that you find in your lunch. We will go over some of the items together, such as reusable thermos, single-serving container, cellophane, aluminum foil, and anything else a student is unclear on. I will then ask the students to rate the lunch that is sitting in front of them.

• After I see a student has completed his/her chart, I will tell him/her to share the findings with a neighbor, and to have a discussion on how they both could reduce the amount of waste that is produced from that lunch (get a reusable lunch bag, use a thermos, etc).

• The students will have about five minutes to discuss their findings, and then I will allow them to move on to the remaining part of the handout, which will be turned in for homework.

Accommodations for all special education students:

• Give directions one at a time.
• Check for understanding.
• Repetition of directions.
• Restate directions for clarification.
• Extended time for assignments.

Practice/Application:

The application for today’s lesson on making recycled paper is having the students complete the “Rate-A-Lunch Bag” worksheet for homework.

Evaluation of Student Learning:

I will grade and record the grades of the students’ work on the “Rate-A-Lunch Bag” worksheet, which will be turned in the day after the students have observed the contents of their lunches. The goal is for each student to get at least 80% on the homework, or 5½ out of 7 possible correct.
Closure:

To close this lesson, I will ask the students if any of them have come up with some good ideas on how to reduce the amount of trash that is produced during lunch each day, and if they would share those ideas with the rest of the class. If time permits, we will have a short discussion about each of the suggestions, and talk about the benefits of reducing garbage in a lunch may have on the environment.

Evaluation of Lesson: Personal Reflection

I was overwhelmed by the numbers of students that brought their lunches from home today. On a typical day, there are two or three students in my class that will bring a lunch from home, and the rest buy their lunch at school. I know that several of my students are on a free- or reduced-lunch program at school, so I was not expecting very many lunches from home to come in. I was prepared to have the students examine my own lunch, just so I didn’t have to create three groups of seven (or worse, two groups of ten and eleven). I had ten students bring in a lunch from home today, which was just enough for everyone to partner up with one person. Also, when we had our short discussion about how much garbage each student creates every day during school at lunch time, the students really seemed to pick up on the concept. They were genuinely concerned with the large amounts of trash a human being can create. I was also very impressed with my students about how well they worked with each other. As third graders, they have not had the opportunity to work with each other or in partners very much, and it seems very easy for any of them to spark into arguments at a moment’s notice. Today, however, for the most part, they seemed eager to hear each other’s suggestions on how to reduce trash, and cooperated very well with each other. If I could change anything in this lesson, it would be that every student would have his/her own lunch to rate, but I know in a school like this one, that would probably never happen. Things went a lot smoother than I had anticipated today, so I consider this lesson to have been a good idea, a fun activity, and an overall hit with my students.
Rate-A-Lunch Bag
Find out how “energy-efficient” your lunch packaging is!

1. Take out the contents of your lunch bag and put it on the desk.
2. Record the number of items that you find in your lunch:

<table>
<thead>
<tr>
<th>reusable lunch box</th>
<th>paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>reusable thermos</td>
<td>wax paper</td>
</tr>
<tr>
<td>single-serving container</td>
<td>plastic wrap or baggie</td>
</tr>
<tr>
<td>reusable plastic container</td>
<td>aluminum foil</td>
</tr>
<tr>
<td>plastic straw</td>
<td>cellophane</td>
</tr>
<tr>
<td>napkin</td>
<td>plastic silverware</td>
</tr>
<tr>
<td>metal silverware</td>
<td>twist-tie</td>
</tr>
<tr>
<td>other (describe)</td>
<td>other (describe)</td>
</tr>
</tbody>
</table>

3. Do you (or would you) throw all these items away every day?

4. How could you use less packaging so you make less garbage?

5. Write a list of 3 things you can do at home to cut down on garbage:

A. ____________________________________________
   ____________________________________________
   ____________________________________________

B. ____________________________________________
   ____________________________________________
   ____________________________________________

C. ____________________________________________
   ____________________________________________
   ____________________________________________
Name: Ben

Rate-A-Lunch Bag

Find out how “energy-efficient” your lunch packaging is!

1. Take out the contents of your lunch bag and put it on the desk.
2. Record the number of items that you find in your lunch:

<table>
<thead>
<tr>
<th>Item</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>reusable lunch box</td>
<td>0</td>
</tr>
<tr>
<td>reusable thermos</td>
<td>0</td>
</tr>
<tr>
<td>single-serving container</td>
<td>0</td>
</tr>
<tr>
<td>reusable plastic container</td>
<td>0</td>
</tr>
<tr>
<td>plastic straw</td>
<td>0</td>
</tr>
<tr>
<td>napkin</td>
<td>0</td>
</tr>
<tr>
<td>metal silverware</td>
<td>0</td>
</tr>
<tr>
<td>other (describe)</td>
<td>0</td>
</tr>
<tr>
<td>paper</td>
<td>0</td>
</tr>
<tr>
<td>wax paper</td>
<td>0</td>
</tr>
<tr>
<td>plastic wrap or baggie</td>
<td>0</td>
</tr>
<tr>
<td>aluminum foil</td>
<td>0</td>
</tr>
<tr>
<td>cellophane</td>
<td>0</td>
</tr>
<tr>
<td>plastic silverware</td>
<td>0</td>
</tr>
<tr>
<td>twist-tie</td>
<td>0</td>
</tr>
<tr>
<td>other (describe)</td>
<td>0</td>
</tr>
</tbody>
</table>

3. Do you (or would you) throw all these items away every day?
   - I would throw away the plastic bottles

4. How could you use less packaging so you make less garbage?
   - Use plastic containers for my chips and my sandwich.

5. Write a list of 3 things you can do at home to cut down on garbage:
   A. Use plastic containers.
   B. Recycle anything you want.
   C. Use dishes not plastic.
Molly and Tristan work on rating Molly's bag lunch.
Lesson #8

Litter Hunt

[Image: A cartoon illustration of animals holding signs about littering. The signs say:
- Litter Hurts
- We don't need your stinkin' trash
- We don't dump trash where you live
- I'm bitter about litter
- Gitters against Litter]
Lesson #8
Litter Hunt

Materials:
- pair of rubber gloves, one set per student
- one plastic grocery bag, one per student
- outdoor area (recess area, open field by school, etc)
- newspaper to lay on the ground (where the litter will be displayed after the hunt is over)

Objective/Academic Standard:

Science Standard 1 ~ The Nature of Science and Technology → Students, working collaboratively, carry out investigations. They question, observe, and make accurate measurements. Students increase their use of tools, record data in journals, and communicate results through chart, graph, written, and verbal form.

Scientific Inquiry 3.1.2 → Participate in different types of guided scientific investigations, such as observing objects and events and collecting specimens for analysis.

3.1.4 → Discuss the results of investigations and consider the explanations of others.

The Scientific Inquiry 3.1.5 → Demonstrate the ability to work cooperatively while respecting the ideas of others and communicating one’s own conclusions about findings.

Technology & Science 3.1.8 → Describe how discarded products contribute to the problem of waste disposal and that recycling can help solve this problem.

The student will be able to collect specimens for analysis and discuss the results of investigations with others. The student will also be able to describe how discarded products contribute to the problem of waste disposal and that recycling can help solve this problem.

Motivation:

I will begin today’s lesson by telling the students that part of the lesson will take place outside today. I will tell the students that not only will it take place outside, but we will be helping to clean up the environment at the same time. I will ask the students if they have any ideas as to what we will be doing today, and see if a short discussion will lead to the correct answer (going on a litter hunt and collecting the litter to talk about it later).
Goal for Learner:

The goal for the learner for this lesson is that the student will collect litter from outside and be able to bring it inside, share it with others, and participate in a discussion about what it is, what it’s from, how it got there, etc. The student will also be able to tell why the litter that the class collected from outside contributes to the problem of getting rid of garbage, and what can be done to decrease this problem (by making a poster to discourage littering).

Content and Procedures:

Teacher Content: Make sure it is a decent day outside, and good weather for the students to pick up trash. Also inform the students that they will be washing their hands very thoroughly with soap after this activity is over.

Procedure:

- I will pass out a set of rubber gloves to each student, as well as one plastic grocery bag. I will then partner the students up (if we are going to be in a large area), or they will be working by themselves (if we are going to be in a smaller area where I can watch all the students at all times). I will instruct the students to walk around and pick up every piece of litter that they see on the ground and put it in their plastic bags. We will define the word litter (something that is out of place in the environment and is considered garbage or trash). I will tell the students they have about ten minutes to pick up as much litter as they can find. We will then walk outside, and the students will have ten minutes to complete the task.

- After coming back inside, I will lay out a few newspapers on the ground and have the students come up in pairs and dump the contents of their plastic bags on to the newspaper layers. I will then have the students throw away their plastic bags and rubber gloves, and give them three minutes to get to the rest room and wash their hands very well with soap.
• Once all of the students have returned from the rest room, I will put on a pair of rubber gloves and pick up a piece of litter from the pile the class has collected. We will decide what is is (as a class), where it came from, how it probably got there, etc. We will continue to do this for as long as time will allow. I will make sure that all students participate in the discussion, while continually reminding everyone that opinions are allowed, and there are no wrong answers.

• When time has expired, I will throw away all of the litter the students have found and wash my hands.

**Accommodations for all special education students:**

• Give directions one at a time.
• Check for understanding.
• Repetition of directions.
• Restate directions for clarification.
• Extended time for assignments.

**Practice/Application:**

The application for today's lesson on making recycled paper is having the students use their artistic talent by creating some type of environmental poster for homework.

**Evaluation of Student Learning:**

I will give credit and record the grades of the students' work on the environmental posters, which will be turned in the day our litter hunt. I will not give much instruction on the assignment, as I want the students to be as creative and original as possible. The goal is for each student to turn in a poster and receive credit for it.
Closure:

To close this lesson, I will ask the students what they have learned today while participating in and discussion their litter hunt. I will also ask the students what else they have done today, besides picking up garbage for class (they have helped the environment by cleaning up garbage that has been thrown outside). I will then ask them to all tell me at the same time if they are helping the Earth by picking up litter (yes). I will also ask them if this is something they can do for the rest of their lives, by picking up garbage, not littering themselves, and not allowing others to litter (yes, yes, and yes).

Evaluation of Lesson: Personal Reflection

We finally had a decent-weather day to go outside and do this lesson. I was getting a little worried because I put this lesson off as much as I could... I only had one day of breathing room left. It didn’t occur to me that by doing my unit near the end of Fall, I might not have the luxury of letting the students go outside to pick up litter because it’s too cold out! Thankfully, it rose about 40 degrees today, so the litter hunt was able to happen. The kids had so much fun doing it, I am almost tempted to have them do it once a week. They each got one rubber glove and a plastic bag, and I told them to find as much litter in their recess area as they possibly could. I think all of us were surprised by how much garbage they found in ten minutes. After we had put all of our garbage in a pile on the floor and the students washed their hands, I put on gloves myself and held up pieces of garbage for us to discuss. The students were extremely attentive during this process, and everyone was participating. Of course one of my kids found something that a typical 3rd grader wouldn’t be able to handle... a pair of boys’ underwear. It got lots of laughs and “ews” from the kids, but it just proved the interesting things that people don’t manage to throw in their garbage cans. Showing the students the overheads of the wildlife being affect by litter was also very powerful for them. I think they really realized that not only does litter pollute our water, air, and harm our plants, but it can harm and kill wild animals. If I could change anything about this lesson, it would be to conduct it earlier in the year, when it is warmer out and the students don’t have to freeze while picking up litter. The homework assignment was also very successful, in that the students were allowed to express their creativity and show their concern for the environment.
Overhead: Ways Litter Injures Wildlife

1
Stop littering

2
See this mouse
people did this
by littering!

2
This pop can
holder will choke this
bird.

3
Look at the hill
people did this

Poppcorn box
paper
bag
Things people throw out on the ground

baws

Candy wrappers
Pop cans

wrappers mostly every tiny

Don't litter
Don't Litter

Poem

Littering is wrong, recycling is right.
Don't let the trash you'll see make you feel tight.

Litter

Don't

Christian
Mikayla and Mike dump the litter they collected around the school playground.

Zach and Kacie contribute their litter to the pile.
Kerrigan assists me in discussing our litter pick-up.

I pose with all of the litter the students picked up.
Lesson #9

Ocean In A Bottle
Lesson #9
Ocean In A Bottle

Materials:
- 3 two-liter empty plastic pop bottles, one set per class
- one plastic funnel, one per class
- enough water to fill each plastic bottle half-way
- three cups vegetable oil
- three cups laundry detergent
- “Polluting the Sea,” by Tony Hare (book), one per class
- “Spill! The Story of the Exxon Valdez,” by Terry Carr (book), one per class
- guidelines of writing the postcard, one per student [attached]
- rubric for postcard writing, one per student [attached]

Objective/Academic Standard:

Science Standard 6 ~ Common Themes → Students work with an increasing variety of systems and begin to modify parts in systems and models and notice the changes that result. They question why change occurs.

Models and Scale 3.6.3 → Explain how a model of something is different from the real thing but can be used to learn something about the real thing.

Language Arts Standard 5 ~ WRITING: Writing Applications → Students continue to write compositions that describe and explain familiar objects, events, and experiences. Students write both informal and formal letters. Student writing demonstrates a command of Standard English and the drafting, research, and organizational strategies outlines in Standard 4 – Writing Process. Writing demonstrates an awareness of the audience and purpose for writing.

- Write descriptive pieces about people, places, things or experiences that:
  - develop a unified main idea
  - use details to support the main idea.
The student will be able to explain how the models of the "polluted oceans" are different from the real thing, but can be used to learn something about actual polluted oceans. The student will also be able to write a descriptive piece about experiencing an oil spill, using a main idea and details to support that main idea with at least 80% accuracy.

Motivation:
I will begin today’s lesson by asking the students if they have ever heard of an oil spill. I will have them guess at what an oil spill involves (oil, usually an ocean, a boat, etc). I will ask them if they have any guesses as to who or what is affected by an oil spill (people, animals, the environment, etc). I will then tell them that I am going to show them a demonstration where we create our own oil spills and water pollution, just to see how they work and what effects it has on the ocean (or water).

Goal for Learner:
The goal for the learner for this lesson is that the student will be able to experience an oil spill and the effects it has on the water by watching a model demonstration. The student will also be able to write a postcard to whomever they want from the perspective of being at an oil spill and helping to clean up after it.

Content and Procedures:
Teacher Content: The Exxon Valdez occurred in March of 1989. More than 11 million gallons of crude oil leaked into the waters of Prince William Sound in Alaska. Oil poured out so quickly at the beginning that a wave of it, three feet high, came out of the water. The oil covered 900 square miles in a week, covering the water’s surface. It killed over 27,000 birds, over 1,000 otters, and an uncountable number of fish and other wildlife. Oil separates from water, it does not mix with it. Soap mixes with water. When soap and oil are both combined with water, the soap breaks the oil down enough to have it mix with the water, therefore the oil no longer floats.
Accommodations for all special education students:

- Give directions one at a time.
- Check for understanding.
- Repetition of directions.
- Restate directions for clarification.
- Extended time for assignments.

Practice/Application:

The application for today’s lesson on pollution in the water is to have the students pretend like the have witnessed an oil spill in the ocean. They can decide whether they want to be a tourist or a person who is helping to clean up the spill. They have to write a postcard (to whomever they want) about what they see, what they are doing, what caused the spill, etc. I will give them a list of guidelines they should follow. They will also have an option of drawing a picture of what they are seeing. The assignment will be turned in the following day.

Evaluation of Student Learning:

I will give grade and record the grades of the students’ work on their oil spill post cards, which will be turned in the day following our Ocean in a Bottle activity. I will follow the rubric while grading the assignment, and record the student’s grades in their total science grades.

Closure:

To close this lesson, I will ask the students what they have learned today while observing our own demonstration of ocean pollution, plus by hearing and seeing pictures about the Exxon Valdez oil spill. I will ask them what kinds of effects oil spills have on the environment, and how we can prevent these from happening.
Procedure:

- I will set up my three plastic bottles, which will each already be filled halfway with water. I will tell the students that each bottle represents an ocean. In the first bottle, I will use the funnel and pour two cups of oil. Before I do that, however, I will ask the students to predict what will happen if I pour the vegetable oil in the water. After hearing their predictions, I will do it and the class will watch and see what happens (the oil will separate from the water). I will then ask the students what they think will happen when I shake the water and oil mixture up. I will then do this experiment, and we will discuss the results (the oil will still stay separate from the water, although it may take a minute or two to settle).

- In the second bottle, I will have the students first predict what will happen when I pour the laundry detergent in it. After hearing their predictions, I will pour two cups of the soap in the water, and we will watch and discuss what happens (the soap will begin to mix with the water). I will then shake the bottle up, and we will watch and discuss what happens (the soap will mix with the water and create bubbles at the top layer).

- In the third bottle, I will tell the students that I’m going to add a cup of vegetable oil and a cup of laundry detergent, and ask them to make a prediction as to what will happen. After they make their predictions, I will pour the two liquids in the water, and we will observe what will happen. Next, I will shake the bottle up and we’ll observe what happens (the soap will begin to break the oil down, and both will start to combine with the water).

- After the three bottles have had the materials added to them, we will discuss which bottle is like an oil spill from a boat, which is like a chemical spill from a factory or a boat, and which is a combination of both (vegetable oil, laundry detergent, and both, respectively). We will then discuss the effects that these spills may have on ocean life. I will get out the “Spill!” and “Polluting the Sea” books, and share facts and pictures with my students.
Evaluation of Lesson: Personal Reflection

Today's lesson ran decently. Things could have gone better, but things have also gone worse. If I could change anything for my lesson for next time, it would be to be more prepared in setting up for the "oceans." I would bring an extra table into the classroom to set up in the front, because the two-liter bottles and other supplies take up more room than I had to work with in our classroom. I would also be sure to set newspapers down first, because vegetable oil and laundry detergent can get a little messy. The entire demonstration was cramped because there is limited space in our classroom and the overhead projector was in the way. The students reacted very well to today's lesson, however. They were all very excited about the "oceans in bottles" demonstrations, and I really feel that they were able to grasp the concept of an oil spill and of a chemical spill because of the demonstrations that they saw. Some of the kids were also deeply affected by the pictures of the oil spill from the Exxon Valdez that I held up. I actually started to feel badly because two of the girls were starting to tear up about all of the animals that died. However, a bright side to that is that they were affected by the lesson, and I don't feel it is something they will soon forget. None of the students in my class were aware of the danger and destruction from oil spills, and I am confident in believing that I was able to further educate them on this topic with this lesson. This was probably the best (and most impacting lesson) that I taught my students, and I am extremely glad that this experience occurred.
Oil Spill Postcard

You have traveled back in time to March, 1989. You are on vacation in Alaska when the Exxon Valdez accident occurs. Millions of gallons of oil are leaking into the ocean, and you are there! Write a postcard to a family member or friend back home.

Make sure to include all of the following:

- where you are
- what major event has happened (hint: the Exxon Valdez oil spill)
- what you see (use details!)
- what you’re feeling
- Are you going to help in the clean-up process? Why or why not?
- a drawn picture of what you see or where you are

USE COMPLETE SENTENCES!!
## Oil Spill Postcard Rubric

<table>
<thead>
<tr>
<th>Does the student answer the following...</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>where you are</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>what major event happened</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>what you see</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>what you’re feeling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>are you going to help?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why/why not?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>picture drawn</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Student’s Name: ____________________________**

**Total: /12**
<table>
<thead>
<tr>
<th></th>
<th>1 makes an attempt, but not clear and/or accurate</th>
<th>2 clear and accurate response</th>
</tr>
</thead>
<tbody>
<tr>
<td>where you are</td>
<td></td>
<td></td>
</tr>
<tr>
<td>what major event happened</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>what you see</td>
<td></td>
<td></td>
</tr>
<tr>
<td>what you're feeling</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>are you going to help? why/why not?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>picture drawn</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Student's Name: **Heather H.**

Total: **12/12**
Oil Spill postcard

Dear Jake,

I am really having fun on vacation in Alaska. We are on a big cruise ship. But something terrible happened! A ship called the Exxon Valdez had an accident and spilled lots of oil in the water. There are dead fish and birds everywhere! The ocean looks black and yucky. I feel sad for the animals. I want to help clean up the mess so I can help the animals and the environment. See you when I get back home.

Your cousin,
Tayloring
## Oil Spill Postcard Rubric

<table>
<thead>
<tr>
<th>Does the student answer the following...</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>where you are</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>what major event happened</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>what you see</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>what you're feeling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>are you going to help?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>why/why not?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>picture drawn</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Student's Name: **Taylor K.**

Total: **12/12**

*100%*
I get ready to pour "oil" in our "ocean."

Creating an oil spill in the ocean.
My 3rd graders watch an oil spill demonstration.

I create an oil and chemical spill in our ocean.
I read parts of a book about oil spills.

I show the students a picture of the oil spill from Exxon Valdez.
Our Three Oceans

(from left to right)

1 ~ oil spill
2 ~ chemical spill
3 ~ oil and chemical spills
Lesson #10

Hazardous Products Substitutes
Lesson #10
Hazardous Products Substitutes

Materials:
• 3 clear glass cups with caution, warning, and danger written on them, one set per class
• food coloring, one bottle per class
• enough water to fill each cup
• small cup of colored water, one per class
• a tablespoon, one per class
• a teaspoon, one per class
• an eye dropper, one per class
• Signal Words handout, one per student [attached]
• Routes of Exposure handout, one per student [attached]
• Identify the Hazards worksheet, one per student [attached]
• Sink to Stream worksheet, one per student [attached]
• Safe Substitutes Recipes handout, one per student [attached]

Objective/Academic Standard:

Science Standard 4 ~ The Living Environment → Students learn about an increasing variety of organisms. They use appropriate tools and identify similarities and differences among them. Students explore how organisms satisfy their needs in typical environments.

Human Identity 3.4.8 → Explain that some things people take into their bodies from the environment can hurt them and give examples of such things.

Science Standard 6 ~ Common Themes → Students work with an increasing variety of systems and begin to modify parts in systems and models and notice the changes that result. They question why change occurs.

Models and Scale 3.6.3 → Explain how a model of something is different from the real thing but can be used to learn something about the real thing.
The student will be able to participate in a demonstration and discussion of models of hazardous products. The student will be able to identify which materials taken in from the environment can hurt human beings and give examples of such materials with at least 80% accuracy.

**Motivation:**

I will begin today’s lesson by writing the three words *caution, warning,* and *danger* on the overhead for the students to see. I will ask them if they have seen these words before, and where they have seen these words. After getting a few suggestions as to where the students have seen these words before, I will ask them *why* they believe those words were put in that place at that time. I will then pull out my three glasses that will be labeled with *caution, warning,* and *danger* (respectively), and tell them they are about to witness a demonstration of those three words.

**Goal for Learner:**

The goal for the learner for this lesson is that the student will be able to identify some products that prove to be harmful to human beings and the environment. The student will watch a teacher-lead demonstration about signal words, and the student will learn what products are harmful, and what products are not necessarily harmful. The student will also learn about treatment of chemicals and materials that have been dumped in the water.

**Content and Procedures:**

Teacher Content: The three signal words that will be focused on in this lesson are *caution, warning,* and *danger*. Caution is a mild/moderate hazard, warning is a moderate hazard, and danger means extremely flammable, corrosive, or highly toxic (poison). Humans can be exposed to hazardous materials by ingestion (swallowing), inhalation (breathing), and absorption (skin contact). When liquids leave a sink, toilet, dishwasher, or washing machine, they all travel through a wastewater treatment facility, which treats the water and then sends it to a stream or river. When liquids travel down a storm drain, they go directly to the stream or river.
Procedure:

- I will show my class the three glass cups, which will be labeled “Caution,” “Warning,” and “Danger.” I will explain that something that has the label caution is the least dangerous, but sometimes there are products that perform the same job that are even less dangerous because they do not carry any warning sign at all. I will tell my students that it is always better for a person’s health and the environment to choose the least toxic product.

- I will next measure two tablespoons of colored water and pour them into the “Caution” glass. For the “Warning” glass, I will measure one teaspoon of colored water and pour it in. For the “Danger” glass, I will measure one drop of colored water and pour it in. I will then tell my students that the amounts of colored water in each container are the amounts of each product that would seriously hurt or kill a 150-pound adult. Which product is the most dangerous? (danger glass; it only has one drop of colored water) I will then ask my students how they are different from a 150-pound adult, and if it would take less or more of a hazardous product to make them sick? (less)

- I will then ask my students what kinds of protective clothing can be worn or precautions can be taken when working with chemicals? (gloves, goggles, masks, special clothing, etc) I will then pass out the handout “Routes of Exposure,” and we will discuss each route (ingestion, inhalations, and absorption). I will also pass out the Signal Words chart, as a reminder to the students as to what is the most dangerous, and how much of that product it would take to hurt an adult.

Accommodations for all special education students:

- Give directions one at a time.
- Check for understanding.
- Repetition of directions.
- Restate directions for clarification.
- Extended time for assignments.
Practice/Application:

The application for today’s lesson on hazardous products substitutes will be a two-worksheet packet on identifying hazards and where water goes (from a household or a storm drain). The students will have to identify which pictures out of eighteen are hazards to people or the environment if used or thrown away incorrectly. The students will also get to complete a “fun” maze, which will show the path that dirty water takes from toilets, dishwashers, sinks, washing machines, and storm drains.

Evaluation of Student Learning:

I will give grade and record the grades of the students’ work on their identifying hazards and water routes worksheets. These grades will be recorded and counted in their total science grades.

Closure:

To close this lesson, I will ask the students what they thought was most interesting about today’s lesson. This open question will leave an opportunity for a discussion about almost anything, which will be teacher- and student-led. We will talk about using hazardous products correctly, and we’ll go over safety precautions for the products again as well. If time permits, I will also pass out the handout Safe Substitutes Recipes, and we will discuss it as a class. This handout has several suggestions of safer formulas for cleaning products and other materials used in the home. I will have the students take this home and ask them to share it with their parents.
Evaluation of Lesson: Personal Reflection

I was a little nervous about today’s lesson, just because I wasn’t sure if the students were going to “get it.” The demonstration could have been slightly confusing, but I think it turned out all right. The students were definitely able to confidently tell me which of caution, warning, and danger was the least dangerous and the most dangerous. We talked about household products and the dangers that some of them pose, and the students really seemed to enjoy the page that described alternative recipes for normally dangerous things. I suggested to them that they take that list home and show their parents, and one even suggested putting it on the refrigerator, which I thought was fantastic. As I expected, the students were extremely excited about the demonstration, even if it only involved water and a little food coloring. I really enjoy being able to teach the students when they are so attentive and they want to learn... it makes things so much more enjoyable! We also talked about dumping chemicals down the storm drain and how that stuff goes straight to the river and what that could cause. The students really seemed to have taken a liking to my unit, and I felt that they have not only learned a lot, but will retain quite a bit of that information with them for the rest of their lives. I’m glad I was able to find a subject that they could all relate to and experience themselves, which is the environment. Our recycling project is going quite well too, and the kids really enjoy being able to help out. If I could change anything about this lesson, I would probably allow more time and let students get into pairs and create the caution, warning, and danger mixes themselves, just to let them have more hands-on experience with it.
Read labels, look for signal words.

**MORE DANGEROUS**

**DANGER**
Extremely flammable, corrosive or highly toxic (poison)
Less than 1 teaspoon can harm an adult

**WARNING**
Moderate hazard
1 teaspoon to 1 ounce can harm an adult

**CAUTION**
Mild/moderate hazard
1 ounce or more can harm an adult
Overhead: Routes of Exposure

Ingestion (Swallowing)

Inhalation (Breathing)

Absorption (Skin Contact)
Worksheet: Identify the Hazards

Student name:

Circle the items that are most likely to be a hazard to people or the environment if used or disposed of incorrectly.

Images courtesy of California Integrated Waste Management Board
Student Name:

Draw a line from the sink to the stream. Using a different color for each, do the same with the toilet, the storm drain, the dishwasher, and the washing machine. Which one(s) go directly to the stream? Which one(s) go through a treatment facility?
Air Freshener
A few cotton balls
Place a few drops of vanilla extract onto the cotton balls and set inside a cup or bowl
Good for the home, car, or refrigerator.

For unpleasant odors:
Boil 1 TBL of white vinegar in 1 cup of water.

Drain Maintenance
1/2 cup of baking soda in the drain
Follow with 1/2 cup of vinegar
Cover and allow to sit for 15 minutes.
Rinse with 2 quarts of boiling water.
Do this regularly to keep drains fresh and to help prevent clogs.

Glass Cleaner
1 quart of warm water
1/4 cup of white vinegar or 2 TBL of lemon juice
Mix and store in a spray bottle. Coffee filters make good glass cleaning rags and can be composted!

Vinyl Floor Cleaner
1 gallon of warm water
1/2 cup of white vinegar or 1/4 cup of borax
Mix in a bucket and mop as you normally would.

Moth Balls
Store wools in sealed plastic bags or airtight containers.
Place garments in the freezer for several days to kill moths or larvae.
Vacuum rugs, carpet and upholstered furniture regularly.

Fertilizer
Amend your soil with a 2/3 soil to 1/3 compost ratio. This will add nutrients, help the soil retain water and keep plants hardy without the use of chemical fertilizers.

Slug Removal
Create slug traps with plastic food tubs. Cut several 1-inch square openings around the tub about 2-3 inches from the bottom. Place tub into the ground so that the openings are just above ground level. Fill tub with 1/2 inch of beer or yeast mixture and cover with lid. Empty every couple of days.
Yeast mixture: 2 TBL flour, 1/2 tsp of baker’s yeast, 1 tsp of sugar in 2 cups of warm water.
Worksheet: Identify the Hazards

Student name: \( \text{\textbf{Ameye}} \)

Circle the items that are most likely to be a hazard to people or the environment if used or disposed of incorrectly.

Images courtesy of California Integrated Waste Management Board
Student Name: 

Draw a line from the sink to the stream. Using a different color for each, do the same with the toilet, the storm drain, the dishwasher, and the washing machine. Which one(s) go directly to the stream? Which one(s) go through a treatment facility?
Our "danger," "warning," and "caution" examples.

Shadings of colored water for our Hazardous Products.
Unit
Post Test
Unit Test

The Environment

Environment Concepts

Directions: Write the letter of the BEST answer on the line.

1. Using “The Three R’s” is a good way to help protect the environment. Which of the following words does not fit in “The Three R’s” category?
   A. reduce
   B. reuse
   C. rewind
   D. recycle

2. A large area where trash is buried is called a _____.
   A. recycling plant
   B. landfill
   C. fertilizer
   D. green house

3. Which of the following items is most likely to be a hazard to people or the environment if used or thrown away incorrectly?
   A. cereal
   B. flowers
   C. pop (or soda)
   D. drain cleaner

4. Which of the following materials cannot be recycled?
   A. Styrofoam
   B. glass
   C. paper
   D. plastic

5. How long does it take for a plastic jug to decompose?
   A. 1 year
   B. 10 years
   C. 100 years
   D. 1,000,000 years
Vocabulary

Directions: Write the letter of the correct answer on the line. Use each word once.

____ 6. When we change something so it can be used again, we ____ it.

____ 7. A natural resource that can be replaced in a fairly short period of time is a ____.

____ 8. A resource that cannot be replaced once it is used up is a ____.

____ 9. Trees, iron ore, water, and air are each a ____.

____ 10. The saving and wise use of Earth’s resources is called ____.

Environment Concepts

Directions: Write the letter of the BEST answer on the line.

____ 11. Litter is ____.
   A. waste that is out of place.
   B. a nonrenewable resource.
   C. good for the Earth.
   D. a type of energy.

____ 12. Which of the following materials can be recycled?
   A. baby diapers
   B. batteries
   C. bleach
   D. pop (or soda) cans

____ 13. How long does it take for a banana peel to decompose?
   A. 1 day
   B. 3-4 weeks
   C. 10 months
   D. 2 years
14. Which of the following liquids will not mix with lake water?
   A. salt water
   B. Coca-cola
   C. orange juice
   D. motor oil

15. What is pollution?
   A. cleaning up the environment
   B. really loud music
   C. making something dirty or unsafe for life
   D. studying the environment

Critical Thinking

Directions: Answer the questions on the lines provided.

16. If a person litters and throws the plastic ring from the top of a bottle of soda next to a river, what can happen to an animal that finds that plastic ring?

17. Name a nonrenewable resource.

18. Think about the book The Lorax. List two problems the thneed factory caused for the environment.

19. Give an example of what old car and truck tires can be recycled into.

20. Think about the book The Lorax. What ended up happening to the Lorax?
1. Using "The Three R's" is a good way to help protect the environment. Which of the following words does not fit in "The Three R's" category?
   A. reduce
   B. reuse
   C. rewind
   D. recycle

2. A large area where trash is buried is called a ______.
   A. recycling plant
   B. landfill
   C. fertilizer
   D. green house

3. Which of the following items is most likely to be a hazard to people or the environment if used or thrown away incorrectly?
   A. cereal
   B. flowers
   C. pop (or soda)
   D. drain cleaner

4. Which of the following materials cannot be recycled?
   A. Styrofoam
   B. glass
   C. paper
   D. plastic

5. How long does it take for a plastic jug to decompose?
   A. 1 year
   B. 10 years
   C. 100 years
   D. 1,000,000 years
Vocabulary

Directions: Write the letter of the correct answer on the line. Use each word once.

6. When we change something so it can be used again, we ___ it.
   - D

7. A natural resource that can be replaced in a fairly short period of time is a ___.
   - E

8. A resource that cannot be replaced once it is used up is a ___.
   - C

9. Trees, iron ore, water, and air are each a ___.
   - B

10. The saving and wise use of Earth's resources is called ___.
    - A

Environment Concepts

Directions: Write the letter of the BEST answer on the line.

11. Litter is ___.
    - A. waste that is out of place.
    - B. a nonrenewable resource.
    - C. good for the Earth.
    - D. a type of energy.

12. Which of the following materials can be recycled?
    - A. baby diapers
    - B. batteries
    - C. bleach
    - D. pop (or soda) cans

13. How long does it take for a banana peel to decompose?
    - A. 1 day
    - B. 3-4 weeks
    - C. 10 months
    - D. 2 years
14. Which of the following liquids will not mix with lake water?
   A. salt water
   B. Coca-cola
   C. orange juice
   D. motor oil

15. What is pollution?
   A. cleaning up the environment
   B. really loud music
   C. making something dirty or unsafe for life
   D. studying the environment

Critical Thinking

Directions: Answer the questions on the lines provided.

16. If a person litters and throws the plastic ring from the top of a bottle of soda next to a river, what can happen to an animal that finds that plastic ring?
   It might die because he/she ate it.

17. Name a nonrenewable resource.
   A piece of coal.

18. Think about the book *The Lorax*. List two problems the thneed factory caused for the environment.
   The bear things had to leave because they had no food. And the fish had to leave because they polluted the water.

19. Give an example of what old car and truck tires can be recycled into.
   Playground material.

20. Think about the book *The Lorax*. What ended up happening to the Lorax?
   He left because they cut down all the truffula trees and made everyone go away.
Environment Concepts

Directions: Write the letter of the BEST answer on the line.

1. Using "The Three R's" is a good way to help protect the environment. Which of the following words does not fit in "The Three R's" category?
   - A. reduce
   - B. reuse
   - C. rewind
   - D. recycle

2. A large area where trash is buried is called a ___.
   - A. recycling plant
   - B. landfill
   - C. fertilizer
   - D. green house

3. Which of the following items is most likely to be a hazard to people or the environment if used or thrown away incorrectly?
   - A. cereal
   - B. flowers
   - C. pop (or soda)
   - D. drain cleaner

4. Which of the following materials cannot be recycled?
   - A. Styrofoam
   - B. glass
   - C. paper
   - D. plastic

5. How long does it take for a plastic jug to decompose?
   - A. 1 year
   - B. 10 years
   - C. 100 years
   - D. 1,000,000 years
Vocabulary

Directions: Write the letter of the correct answer on the line. Use each word once.

6. When we change something so it can be used again, we ___ it.
   D

C. A natural resource that can be replaced in a fairly short period of time is a __.
   A

A. A resource that cannot be replaced once it is used up is a __.
   E

E. Trees, iron ore, water, and air are each a __.
   B

B. The saving and wise use of Earth's resources is called __.

Environment Concepts

Directions: Write the letter of the BEST answer on the line.

11. Litter is
   A. waste that is out of place
   B. a nonrenewable resource.
   C. good for the Earth.
   D. a type of energy.

12. Which of the following materials can be recycled?
   A. baby diapers
   B. batteries
   C. bleach
   D. pop (or soda) cans

13. How long does it take for a banana peel to decompose?
   A. 1 day
   B. 3-4 weeks
   C. 10 months
   D. 2 years
16. If a person litters and throws the plastic ring from the top of a bottle of soda next to a river, what can happen to an animal that finds that plastic ring?

The animal can get stuck in it by throwing it in the river.

Critical Thinking

Directions: Answer the questions on the lines provided.

17. What is pollution?
   A. cleaning up the environment
   B. really loud music
   C. making something dirty or unsafe for life
   D. studying the environment

Name a nonrenewable resource.

recycling

18. Think about the book The Lorax. List two problems the thneed factory caused for the environment.

1. Made the fish water taste.
2. Cut down all of the trees.

19. Give an example of what old car and truck tires can be recycled into.

     playing egotmetal gravel

20. Think about the book The Lorax. What ended up happening to the Lorax?

     The Lorax was mad, and the fish water was nasty and the evaiper was bad, and the trees were hewn down and the air was so musty up the binders.
Graphs of Student Progress
<table>
<thead>
<tr>
<th>NAME</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amos, Kerman</td>
<td>57%</td>
<td>25%</td>
<td>40%</td>
<td>50%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>Brown, Benjamin</td>
<td>34%</td>
<td>15%</td>
<td>20%</td>
<td>93%</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>Coates, Tristan</td>
<td>70%</td>
<td>35%</td>
<td>60%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Fabian, Taylor</td>
<td>40%</td>
<td>35</td>
<td>100%</td>
<td>44%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>Fields, April</td>
<td>24%</td>
<td>95%</td>
<td>100%</td>
<td>78%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Hoist, Truman</td>
<td>48%</td>
<td>35%</td>
<td>60%</td>
<td>71%</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>Fouts, Bailey</td>
<td>24%</td>
<td>95%</td>
<td>40%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>German, Emily</td>
<td>37%</td>
<td>15%</td>
<td>20%</td>
<td>71%</td>
<td>75%</td>
<td>100%</td>
</tr>
<tr>
<td>Hulse, Heather</td>
<td>36%</td>
<td>35%</td>
<td>40%</td>
<td>71%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>Hurst, Mikayla</td>
<td>36%</td>
<td>35%</td>
<td>40%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Ingram, Maleigh</td>
<td>40%</td>
<td>35%</td>
<td>60%</td>
<td>57%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Johnson, Kacie</td>
<td>64%</td>
<td>35%</td>
<td>60%</td>
<td>93%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>King, Taylor</td>
<td>57%</td>
<td>45%</td>
<td>80%</td>
<td>93%</td>
<td>88%</td>
<td>75%</td>
</tr>
<tr>
<td>Lackey, Nicholas</td>
<td>44%</td>
<td>35%</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Littell, Andrews</td>
<td>40%</td>
<td>45%</td>
<td>20%</td>
<td>29%</td>
<td>31%</td>
<td>50%</td>
</tr>
<tr>
<td>Meadows, Zach</td>
<td>52%</td>
<td>45%</td>
<td>80%</td>
<td>71%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>O'keefe, Christian</td>
<td>56%</td>
<td>45%</td>
<td>80%</td>
<td>71%</td>
<td>81%</td>
<td>75%</td>
</tr>
<tr>
<td>Rhum, Mike</td>
<td>44%</td>
<td>45%</td>
<td>80%</td>
<td>50%</td>
<td>45%</td>
<td>0%</td>
</tr>
<tr>
<td>Rogers, Molly</td>
<td>78%</td>
<td>45%</td>
<td>40%</td>
<td>100%</td>
<td>63%</td>
<td>75%</td>
</tr>
<tr>
<td>Smith, Shyehne</td>
<td>24%</td>
<td>35%</td>
<td>60%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Thomas-Kemp, Trevon</td>
<td>48%</td>
<td>45%</td>
<td>80%</td>
<td>81%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Published by Instructor/McGraw-Hill, Paoli, Pennsylvania 19351
## CLASS RECORD SHEET

<table>
<thead>
<tr>
<th>NAME</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amos, Kemgan</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
<td>83%</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>Brown, Berd</td>
<td>100%</td>
<td>—</td>
<td>100%</td>
<td>58%</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>Crates, Tristan</td>
<td>78%</td>
<td>70%</td>
<td>100%</td>
<td>0%</td>
<td>100%</td>
<td>72%</td>
</tr>
<tr>
<td>Fabian, Taylor</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>97%</td>
<td>100%</td>
<td>88%</td>
</tr>
<tr>
<td>Fields, April</td>
<td>83%</td>
<td>83%</td>
<td>100%</td>
<td>100%</td>
<td>70%</td>
<td>97%</td>
</tr>
<tr>
<td>Foust, Truman</td>
<td>83%</td>
<td>90%</td>
<td>100%</td>
<td>100%</td>
<td>70%</td>
<td>62%</td>
</tr>
<tr>
<td>Foust, Bailey</td>
<td>100%</td>
<td>—</td>
<td>0%</td>
<td>42%</td>
<td>100%</td>
<td>52%</td>
</tr>
<tr>
<td>German, Emily</td>
<td>83%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>92%</td>
</tr>
<tr>
<td>Hsie, Heather</td>
<td>100%</td>
<td>90%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>Huest, Mikayla</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Ingram, Haliegh</td>
<td>83%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>88%</td>
</tr>
<tr>
<td>Johnson, Kacie</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>92%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>King, Taylor</td>
<td>83%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Larkey, Nicholas</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>88%</td>
</tr>
<tr>
<td>Littell, Andrew</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
<td>0%</td>
<td>100%</td>
<td>56%</td>
</tr>
<tr>
<td>Meadows, Zach</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
<td>58%</td>
<td>100%</td>
<td>88%</td>
</tr>
<tr>
<td>Oehlough, Christian</td>
<td>100%</td>
<td>90%</td>
<td>100%</td>
<td>92%</td>
<td>100%</td>
<td>84%</td>
</tr>
<tr>
<td>Rhum, Mike</td>
<td>71%</td>
<td>60%</td>
<td>100%</td>
<td>97%</td>
<td>100%</td>
<td>68%</td>
</tr>
<tr>
<td>Rogers, Molly</td>
<td>83%</td>
<td>80%</td>
<td>100%</td>
<td>90%</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>Segrith, Shyehne</td>
<td>83%</td>
<td>80%</td>
<td>100%</td>
<td>92%</td>
<td>100%</td>
<td>72%</td>
</tr>
<tr>
<td>Thomas, Kemp, Tre'Von</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>92%</td>
</tr>
</tbody>
</table>
Individual Students' Percentages
Pre- and Post Tests

Students' Names

<table>
<thead>
<tr>
<th>Students' Names</th>
<th>Pre-Test %</th>
<th>Post Test %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerriga</td>
<td>80</td>
<td>84</td>
</tr>
<tr>
<td>Ben</td>
<td>52</td>
<td>40</td>
</tr>
<tr>
<td>Tristan</td>
<td>72</td>
<td>24</td>
</tr>
<tr>
<td>Taylor F</td>
<td>88</td>
<td>24</td>
</tr>
<tr>
<td>April F</td>
<td>82</td>
<td>32</td>
</tr>
<tr>
<td>Truman</td>
<td>80</td>
<td>36</td>
</tr>
<tr>
<td>Bailey</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Emily</td>
<td>92</td>
<td>92</td>
</tr>
<tr>
<td>Heather Mikayla</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>Jaleigh</td>
<td>100</td>
<td>52</td>
</tr>
<tr>
<td>Taylor</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>Nichola</td>
<td>68</td>
<td>56</td>
</tr>
<tr>
<td>Andrew</td>
<td>52</td>
<td>56</td>
</tr>
<tr>
<td>Zach</td>
<td>84</td>
<td>68</td>
</tr>
<tr>
<td>Christia</td>
<td>80</td>
<td>44</td>
</tr>
<tr>
<td>Mike</td>
<td>72</td>
<td>28</td>
</tr>
<tr>
<td>Molly</td>
<td>72</td>
<td>24</td>
</tr>
<tr>
<td>Shyenn</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Tre' Von</td>
<td>92</td>
<td>92</td>
</tr>
</tbody>
</table>
Pre- and Post Tests Questions
How Many Got Each Question Wrong

Question Number On The Test

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre-Test</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>11</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>16</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>19</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>77</td>
</tr>
</tbody>
</table>
Summary of Results
Summary of Results

One hundred percent of the twenty students in the class earned a higher score on their post tests than their pre-tests. Ten of the students doubled (or higher) their original scores. The two highest scores on the pre-test were sixty and fifty-six percent. The two highest scores on the post test were one hundred percent and ninety-two percent. The two lowest scores on the pre-test were twenty percent and twenty-four percent. The two lowest scores on the post test were fifty-two percent and fifty-six percent.

One student scored above a sixty percent (60% = passing) on the pre-test, and eighteen students scored above a sixty percent on the post test. Mikayla, Taylor K., April, Emily, and Tre’Von all scored above a 90% on their post tests (an ‘A’). Nine students earned a B on their post tests, while three students earned a C, one earned a D, and two earned an F.

Questions 7, 11, 16, 17, 18, and 19 were the six questions that most students got wrong on the pre-test. There were thirteen questions on the pre-test that at least fifty percent of the students in the class got incorrect, while there was one question on the post test that at least fifty percent of the students in the class got incorrect. The average number of questions wrong a student got on the pre-test was about twelve. The average number of questions wrong a student got on the post test was about four. That is about a sixty-six percent increase from the pre-test to the post test.
Unit Resources
Unit Resources

“Landfills”  www.zerowasteamerica.org/Landfills.htm


“Ocean in a Bottle”  www.malvernschool.com/oceanbottle.htm


“Rate a Lunch Bag”  www.lessonplanspage.com/more/rate_your_lunch_bagindex.htm
